CLAIMS

1. A projector comprising:

a laser beam source that outputs a laser beam and modulates the laser beam in a beam form based on an image signal;

a scanning unit that scans the laser beam output by the laser beam source at least in one-dimensional direction;

a scan driving unit that drive controls the scanning unit by a first force;

a retaining unit that stops and retains the scanning unit at a predetermined position by a second force; and

a light shielding unit that shields the laser beam from the scanning unit that is retained by the retaining unit, wherein the scan driving unit releases the scanning unit retained by the retaining unit and drives the scanning unit when the first force is greater than the second force, and the retaining unit stops and retains the scanning unit at the predetermined position when the second force is greater than the first force.

2. The projector according to claim 1, further comprising:

a light source driving unit that drive controls the laser beam source; and

a detecting unit that detects the laser beam incident on the light shielding unit, wherein the light source driving unit stops driving of the laser beam source when the detecting unit detects the laser beam.

3. The projector according to claim 1, wherein

the scan driving unit includes a coil that generates a magnetic force, which is the first force, when an electric current is passed; and

the retaining unit includes an elastic member that generates a bias force that is the second force.

4. The projector according to claim 1, wherein

the scan driving unit includes a coil that generates a magnetic force, which is the first force, when an electric current is passed; and

the retaining unit includes a permanent magnet that generates a magnetic force that is the second force.

5. A projector comprising:

a laser beam source that outputs a laser beam that is modulated based on an image signal;

a scanning unit that scans the beam light within a predetermined surface;

a screen to which the modulated beam light is projected;

a screen monitoring unit that receives light reflected from the screen; and

a beam light supply stopping unit that controls the laser beam source so as to stop output of the laser beam based on an output of the screen monitoring unit.

6. The projector according to claim 5, wherein the screen monitoring unit includes

a light source that emits invisible light; and

a light receiving unit that receives invisible light reflected from the screen.

7. The projector according to claim 6, further comprising a filter that allows the invisible light to pass through and absorb or reflects the laser beam that is arranged in a light path between the screen and the light receiving unit, wherein

the light receiving unit receives the invisible light reflected from the screen, and the beam light supply stopping unit controls the laser beam source so as to stop output of the laser beam when an intensity of the invisible light received by the light receiving unit is lower than a predetermined value.

8. The projector according to claim 6, wherein the light source unit emits the invisible light as modulated light that has a predetermined pulse train; the light receiving unit for screen monitoring receives the invisible light that has the pulse train; and the beam light supply stopping unit controls the laser beam source so as to stop output of the laser beam when the pulse train of the invisible light to be received by the light receiving unit for screen monitoring is not detected.

9. The projector according to claim 6, wherein the screen monitoring unit includes a beam light receiving unit that receives the light reflected from the screen or the light propagated inside the screen from among the beam lights projected to the screen, the beam light supply stopping unit controls the laser beam source so as to stop output of the laser beam when

a correlation value between the beam light projected to the screen and the light reflected from the screen, or

a correlation value between the beam light projected to the screen and the light propagated inside the screen is smaller than a predetermined value.

10. A projector comprising:

a laser beam source that outputs a laser beam that is modulated based on an image signal;

a scanning unit that scans the beam light within a predetermined surface;

a screen to which the modulated beam light is projected;

a scan monitoring unit that monitors scanning of the scanning unit and outputs a result of monitoring; and

a beam light supply stopping unit that controls the laser beam source so as to stop output of the laser beam based on the result of monitoring output by the scan monitoring unit.

11. The projector according to claim 10, wherein the scanning unit is a galvano-mirror whose plane mirror is rotated around a predetermined axis, and the scan monitoring unit is a galvano-mirror monitoring unit to monitor the rotation action of the galvano-mirror.

12. The projector according to claim 10, wherein the scan monitoring unit includes a light source that emits invisible light; and a light receiving unit provided near the outer periphery of the screen and that receives the invisible light, wherein

the scanning unit scans the beam lights and the invisible light.

13. The projector according to claim 10, wherein the scan monitoring unit includes

a light source that emits invisible light;

a reflecting member provided near the outer periphery of the screen and that reflects the invisible light; and

a light receiving unit that receives the invisible light from the reflecting member.

14. A projector comprising:

a laser beam source that outputs a laser beam that is modulated based on an image signal;

a scanning unit that scans the beam light within a predetermined surface;

a reflecting mirror that reflects the beam light scanned by the

scanning unit;

a screen provided opposite to the reflecting mirror and projected with the beam light reflected from the reflecting mirror;

a reflecting mirror monitoring unit that monitors condition of the reflecting mirror and outputs a result of monitoring; and

a beam light supply stopping unit that controls the laser beam source so as to stop output of the laser beam based on the result of monitoring output by the reflecting mirror monitoring unit.

15. The projector according to claim 14, wherein the scan monitoring unit includes a light source that emits invisible light; and a light receiving unit that receives the invisible light that is reflected by the reflecting mirror and propagated inside the screen, wherein

the beam light supply stopping unit controls the laser beam source so as to stop output of the laser beam when intensities of the invisible light received by the light receiving unit are lower than a predetermined value.

16. A projector comprising:

a laser beam source that outputs a laser beam that is modulated based on an image signal;

a scanning unit that scans the beam light within a predetermined surface;

a screen to which the modulated beam light is projected;

a cabinet to house at least the laser beam source, the scanning

unit, and the screen;

a plurality of vibration sensors provided in the cabinet, wherein the vibration sensors output a result of detection; and

a beam light supply stopping unit that controls the laser beam source so as to stop output of the laser beam based on the result of detection output by the vibration sensors.

17. A projector comprising:

a laser beam source that outputs a laser beam that is modulated based on an image signal;

a scanning unit that scans the beam light within a predetermined surface;

a screen to which the modulated beam light is projected;

a cabinet to house at least the laser beam source, the scanning unit, and the screen;

a plurality of reflecting mirrors provided in the cabinet;

a light receiving unit that receives at least a light reflected from the reflecting mirrors and output a result of detection; and

a beam light supply stopping unit that controls the laser beam source so as to stop output of the laser beam based on the result of detection output by the light receiving unit.

18. The projector according to claim 17, wherein the beam light supply stopping unit controls the laser beam source so as to stop output of the laser beam when the detection result indicates that an intensity of

the beam light received by the light receiving unit is lower than a predetermined value.

19. A projector comprising:

a first color laser beam source that outputs a first color beam light that is modulated based on an image signal;

a second color laser beam source that outputs a second color beam light that is modulated based on an image signal;

a third color laser beam source that outputs a third color beam light that is modulated based on an image signal;

a laser unit to house the first color laser beam source, the second color laser beam source, and the third color laser beam source, the laser unit having an opening;

a shutter provided at the opening of the laser unit;

a scanning unit that scans the beam lights within a predetermined surface;

a screen to which the modulated beam lights are projected;

a cabinet to house at least the laser unit, the scanning unit, and the screen;

fixing units to fix the cabinet and the laser unit; and

a laser beam supply stopping unit to stop supply of the laser beams when the cabinet and the laser unit get separated from each other.

20. The projector according to claim 19, wherein the laser beam supply stopping unit includes a shutter driving unit to prevent each of the color beam lights from being emitted from the opening by closing the shutter irreversibly when the cabinet unit and the laser unit get separated from each other.

21. The projector according to claim 20, wherein the laser beam supply stopping unit makes each of the color laser beam sources unable to oscillate in an irreversible way when the cabinet unit and the laser unit get separated from each other.

22. The projector according to claim 20, wherein

the laser unit includes a first circuit substrate that has first recognition data; and a controller that drives each of the color laser beam sources,

the cabinet includes a second circuit substrate that has second recognition data, wherein the second circuit substrate is arranged outside of the laser unit, and

the controller drives each of the color laser beam sources only when the first recognition data and the second recognition data are the same.